Contribution ID: **59** Type: **Oral talk (15 min + 5 min questions)**

The multiplicity of neutrons of spontaneous fission of 250No obtained in complete fusion reactions with heavy ions at the SHELS separator.

Tuesday, 12 July 2022 10:40 (20 minutes)

For more than 20 years, experiments on the synthesis and study of the properties of radioactive decay of short-lived isotopes of transuranic elements have been conducted at the Flerov Nuclear Reactions Laboratory of JINR. The reactions of complete fusion of accelerated multicharged ions with target nuclei heavier than lead were mainly used. In these experiments, experimental installations with kinematic separation of recoil nuclei from background products are most often used. In these installations (separators), the separation in space of recoil nuclei, incoming ions and products of multi-nucleon transfer reactions occurs in electric and magnetic fields due to the difference in their trajectories caused by the difference in their ionic charge and energy (velocity) distributions.
This work describes the kinematic separator SHELS [1], which is used for the synthesis and study of the properties of heavy nuclei. A separator detection system consisting of a time-of-flight system, a focal semiconductor detector and a SFiNx detection system is described [2]. The new detection system consists of an assembly of multi-strip two-sided Si detectors, around which 116 proportional neutron counters filled with 3He are placed. The detector system was used in the experiment to study the characteristics of spontaneous fission of the isotope 250No, in which data on the yields of neutrons of spontaneous fission were compared with previously published results.
Preliminary data were obtained during processing. The neutron detection efficiency was (54.7 ± 0.1)%. The measured average number of neutrons in the 250No fission act was (2.32 ± 0.07), which, taking into account the efficiency of the neutron detector, gives the value of the average number of neutrons ν = (4.24 ± 0.13).

1. Popeko A.G., Yeremin A.V., Malyshev O.N., Chepigin V.I., Isaev A.V., Popov Yu.A., Svirikhin A.I., Haushild K., Lopez-Martens A., Rezynkina K., Dorvaux O. Separator for Heavy ELement Spectroscopy – velocity filter SHELS. // Nucl. Instrum. Methods Phys. Res. B. 2016. 376. P. 140–143.
2. A.V. Isaev et al. The SFiNx Detector System. // Physics of Particles and Nuclei Letters 19.1 (2022), pp. 37–45.

The speaker is a student or young scientist

Yes

Section

1. Nuclear structure: theory and experiment

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